

Study Program for the Sacramento--San Joaquin Estuary

## Memorandum of Understanding

A memorandum of understanding between the United States Geological Survey, the California Department of Fish and Game, the California State Water Resources Control Board, the California Department of Water Resources, the United States Bureau of Reclamation and the United States Fish and Wildlife Service to study the biologically significant variations in hydrodynamics, salinity, and constituent transport within San Francisco Bay and net current speed and direction in selected interior Sacramento-San Joaquin Delta channels which result from changes in delta outflow, tidal pulses, and micro-meteorological conditions.

This Memorandum of Understanding made and entered into this 24th day of September, 1985, by and between the U.S. Geological Survey, hereinafter referred to as the "Survey", the California Department of Fish and Game, hereinafter referred to as the "DFG", the State Water Resources Control Board, hereinafter referred to as the "State Board", the California Department of Water Resources, hereinafter referred to as the "DWR", the U.S. Bureau of Reclamation, hereinafter referred to as the "Bureau", and the U.S. Fish and Wildlife Service, hereinafter referred to as the "Service", do hereby agree as follows:

I. General

- A. It is the intent of the parties to this Memorandum of Understanding to facilitate the implementation of Element II, "Hydrodynamic/Physical/Chemical Studies," for the San Francisco Bay program segment of the Interagency Ecological Study Program for the Sacramento-San Joaquin Estuary. The study plan for Element II was prepared by a hydrodynamic task committee composed of representatives from each of the participating agencies on November 6, 1984. The parties concur that this shall be the plan of study for hydrodynamics in the San Francisco Bay program segment, except as modified by this Memorandum of Understanding. The study plan for Element II, including introduction, needs and justifications, tasks, and work plan schedules, is incorporated herein as if fully set forth.

Also incorporated herein as if fully set forth is the work plan for an interior Delta current study that will determine net current speed and direction in selected interior Delta channels during various flow (Delta input/export) levels.

- B. All parties to this Memorandum of Understanding agree to utilize their funds and resources, as specified herein, to meet the study objectives, as defined in the study plan for Element II and work plan for the interior Delta current study, in the most efficient and economical manner.

## II. Program Coordinators

- A. The Survey Program Coordinator shall be Peter Anttila.
- B. The DFG Program Coordinator shall be H. K. Chadwick.
- C. The State Board Program Coordinator shall be David R. Beringer.
- D. The DWR Program Coordinator shall be Richard Kretsinger.
- E. The Bureau Program Coordinator shall be James Arthur.
- F. The Service Program Coordinator shall be Martin Kjelson.
- G. A Program Coordinator shall be each participating agency's representative for execution of the Memorandum of Understanding and shall have authority to act on behalf of that agency, except as otherwise provided. All communications given to a Program Coordinator shall be as binding as if given to the party.
- H. Any agency may change its Program Coordinator, by providing written notification to each of the other agencies.

## III. Work to Be Performed:

All work performed under this Memorandum of Understanding shall be consistent with the objectives of the study plan for Element II, "Hydrodynamic/physical/chemical Studies" of the San Francisco Bay program segment and the work plan for interior Delta current study, except as modified by this Memorandum of Understanding.

### A. The Survey shall:

1. Act as lead agency for all mathematical modeling. This shall include providing the technical supervision of the interagency modeling team as well as providing two working members to the team.
2. Act as lead agency in the deployment of current meters in the Bay and current meters and/or acoustic velocity meters (AVMs) and in interior

Delta channels and in the testing and evaluation of the Acoustic Doppler Current Profiling equipment. This shall include primary responsibility for the reduction and analyses of all current measurement data.

3. Participate in the program for field measurements of salinity profiles. Provide one boat, one crew, and one set of salinity measurement equipment during each measurement episode.
4. Retain ownership and control of all equipment procured by Survey funds during the conduct of the study.
5. Participate in the coordination and review committees described in Section VIII of this Memorandum of Understanding.

B. The Bureau shall:

1. Act as lead agency in the program of field measurement of salinity profiles. This shall include: (i) organizing and scheduling each measurement episode in consultation with Survey and DWR, (ii) providing one boat, one crew, and one set of salinity measurement equipment during each measurement episode, and (iii) reducing and analyzing all data collected.
2. Provide one member to the interagency modeling team.
3. Retain ownership and control and all equipment procured by Bureau funds during the conduct of the study.
4. Provide the DWR a 31-foot government surplus "Uniflite" boat to be used in the field studies. All costs associated with the acquisition, equipping, operation, and maintenance of the boat provided by the Bureau will be reimbursed annually by the DWR through funding agreements for the Interagency Study Program for the Sacramento--San Joaquin Estuary.
5. Participate in the coordination and review committees described in Section VIII of this Memorandum of Understanding.

C. The DWR shall:

1. Act as lead agency for the electrical conductivity (EC) measurement programs at three existing

stations: San Francisco Bay Bridge, San Mateo Bridge, and Point San Pablo. This shall include reducing and analyzing data from these stations.

2. Participate in the program for field measurements of salinity profiles. Provide one crew, and one set of salinity measurement equipment during each measurement episode. Reimburse the Bureau for costs incurred by the Bureau for acquisition, equipping, operation, and maintenance of the "Uniflite" boat (III.B.4). Reimbursement will be made annually through the funding agreements for the Interagency Ecological Study Program for the Sacramento-San Joaquin Estuary.
3. Provide one member to the interagency modeling team.
4. Retain ownership and control of all equipment purchased by DWR funds during the conduct of this study.
5. Participate in the coordination and review committees described in Section VIII of this Memorandum of Understanding.

D. The DFG shall:

1. Work to facilitate coordination between the biological elements of the San Francisco Bay Program and the hydrodynamic/physical/chemical studies element. The biological elements are the primary responsibility of the DFG and consist of "Marine Species Distributions" (Element V), "Stratification-Induced Current Transportation Study" (Element VI), and "Shrimp Population Dynamics and Trophic Analysis" (Element VII). The coordination will be accomplished through regularly scheduled meetings between element study groups.
2. Participate in the coordination and review committees described in Section VIII of this Memorandum of Understanding.

E. The State Board shall:

1. Provide a list of interior Delta channels for which current data will be collected and participate in the selection of channels and flow conditions.
2. Review all reports from the hydrodynamics and interior Delta current studies.
3. Participate in the coordination and review committees described in Section VIII of this Memorandum of Understanding.

F. The Service shall:

Participate in the coordination and review committees described in Section VIII of this Memorandum of Understanding.

IV. Program Schedule:

It is the intent of all parties of this Memorandum of Understanding to complete the tasks described in the study plan for hydrodynamic studies in San Francisco by September 30, 1990 and to complete the tasks described in the work plan for the interior Delta current study by June 1, 1987.

V. Term

This Memorandum of Understanding is an outgrowth of numerous meetings of technical representatives of the cooperating agencies wherein a need for the specified hydrodynamic and interior Delta current studies was identified and becomes effective on the date of signature by the cooperating agencies, and shall remain in effect through September 30, 1990. An agency may terminate its participation in this Memorandum of Understanding upon 60 days written notice to the other cooperating agencies.

VI. Funding:

- A. This Memorandum of Understanding shall continue in effect only as long as funds for this program are made available to the participating State and Federal agencies during each year of the program, and shall be subject to any conditions on funding imposed by the State Legislature, with respect to the participating State agencies, and by the Congress, with respect to the Federal participating agencies.

- B. The distribution of funding by agency for the hydrodynamic and interior Delta current studies is as follows:

#### VIII. Program Coordination and Review:

The Program Coordinators will review the progress of the San Francisco Bay hydrodynamics study and interior Delta current study as necessary. In addition, a subcommittee of the San Francisco Bay Program Technical Committee consisting of the authorized representative of each program coordinator, shall be established to review in greater depth the hydrodynamic study progress as it relates to the overall outflow study.

This subcommittee will be chaired by the Survey and shall meet quarterly, or more often if necessary, during the conduct of the study. The purpose of this subcommittee will be to foster coordination and information transfer between the participating agencies, to assure compliance with this Memorandum of Understanding and the study plan by all parties, and to ensure coordination with overall San Francisco Bay Program objectives.

INTERAGENCY HYDRODYNAMIC AND INTERIOR  
DELTA CURRENT STUDIES BUDGET  
FEDERAL FISCAL YEARS (1985-90)  
(\$1,000'S) 1/

Federal Fiscal Year 1985

Agency	Funding to Program	Matching Funds <u>2/</u> to Survey	Funds Used by Agency
Survey	191.3	--	382.6
DWR	248	109	193
Bureau	200 <u>3/</u>	0	146
State Board	<u>82.3</u>	<u>82.3</u> <u>4/</u>	<u>0</u>
Total	721.6	191.3	721.6

Federal Fiscal Year 1986

Agency	Funding to Program	Matching Funds <u>2/</u> to Survey	Funds Used by Agency
Survey	310	--	620
DWR	248	80	183
Bureau	200 <u>5/</u>	0	185
State Board	<u>230</u>	<u>230</u> <u>4/</u>	<u>0</u>
Total	988	310	988

Federal Fiscal Year 1987

Agency	Funding to Program	Matching Funds <u>2/</u> to Survey	Funds Used by Agency
Survey	250	--	500
DWR	238	70	183
Bureau	200 <u>5/</u>	0	185
State Board	<u>180</u>	<u>180</u> <u>4/</u>	<u>0</u>
Total	868	250	868

# Federal Fiscal Years 1988 and 1989

(Same as 1987)

## Federal Fiscal Year 1990

Agency	Funding to Program	Matching Funds <u>2/</u> to Survey	Funds Used by Agency
Survey	167.70	--	335.40
DWR	238	70	183
Bureau	200 <u>5/</u>	0	185
State Board	97.7	97.7 <u>4/</u>	0
TOTAL	703.4	167.7	703.4

## Total Funding Summary

Agency	Funding to Program	Matching Funds to Survey	Funds Used by Agency
Survey	1419	--	2838
DWR	1448	469	1108
Bureau	1200	0	1071
State Board	950	950	0
Total	5017	1419	5017

1/ 1985 dollars

2/ Matching funds administered by separate joint funding agreements between the Survey and the indicated agencies.

3/ Funds in the amount of \$54,000 transferred to DWR.

4/ Matching funds paid to the Survey in arrears no more often than monthly upon receipt of invoices from the Survey.

5/ Funds in the amount of \$15,000 transferred to DWR

## VII. Changes in the Work

- A. The Program Coordinators may, at any time as the need arises, authorize changes within the scope of the work without invalidating this Memorandum of Understanding, as long as such changes do not increase the amount due, increase the time required for performance, or result in a substantial change in the work detailed in the study plan as modified by this Memorandum of Understanding. Such changes must be reduced to writing signed by each party's respective program coordinator before taking effect.



SIGNATURE PAGE

The undersigned certifies that he/she has received a copy of the attached Memorandum of Understanding and agrees to the terms and conditions therein.

Agency: U.S. Dept. of Interior, U.S. Geological Survey  
Room w-2235, Federal Building  
Address: 2800 Cottage Way  
Telephone: Sacramento, California, 95825

By: *William L. Bertoldi*

Title: District Chief

SIGNATURE PAGE

The undersigned certifies that he/she has received a copy of the attached Memorandum of Understanding and agrees to the terms and conditions therein.

Agency: U.S. Dept. of Interior, Bureau of Reclamation

Address: 2800 Cottage Way

Sacramento, California 95825

Telephone: (916) 978-5135

By: 

Title: Regional Director

SIGNATURE PAGE

The undersigned certifies that he/she has received a copy of the attached Memorandum of Understanding and agrees to the terms and conditions therein.

Agency: Department of Fish and Game

Address: 1416 Ninth Street

Sacramento, CA 95814

Telephone: (916) 445-9880

By:

Title:

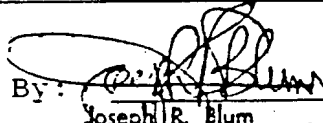
Assistant Director

SIGNATURE PAGE

The undersigned certifies that he/she has received a copy of the attached Memorandum of Understanding and agrees to the terms and conditions therein.

Agency: United States Fish and Wildlife Service  
Lloyd 500 Building, Suite 1692  
Address: 500 N. E. Multnomah Street  
Portland, Oregon 97232

Telephone: \_\_\_\_\_

By: 

Joseph R. Blum  
Title: Acting Regional Director

SIGNATURE PAGE

The undersigned certifies that he/she has received a copy of the attached Memorandum of Understanding and agrees to the terms and conditions therein.

Agency: State Water Resources Control Board

Address: P.O. Box 100

Sacramento, CA 95801

Telephone: (916) 445-1553

By: Raymond Walsh

Title: Interim Executive Director

SIGNATURE PAGE

The undersigned certifies that he/she has received a copy of the attached Memorandum of Understanding and agrees to the terms and conditions therein.

Agency: State Department of Water Resources

Address: 1416 Ninth Street

Sacramento, CA 95814

Telephone: (916) 445-6582

By: 

Title: Director